

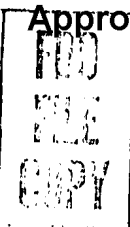
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SOVIET BLOC INTERNATIONAL  
GEOPHYSICAL YEAR INFORMATION  
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SOVIET BLOC INTERNATIONAL GEOPHYSICAL YEAR INFORMATION

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SOVIET BLOC INTERNATIONAL GEOPHYSICAL YEAR INFORMATION

Table of Contents

	<u>Page</u>
I. Rockets and Artificial Earth Satellites	1
II. Cosmic Rays	10
III. Oceanography	11
IV. Arctic and Antarctic	12

I. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Satellite Author Discusses Readers' Questions

A. A. Shternfel'd, Soviet author of the book Iskusstvennyye Sputniki Zemli (Artificial Earth Satellites), discusses readers' questions on satellites in his article in the popular Soviet magazine, Tekhnika - Molodezhi. Following is his series of eleven presentations:

1. How is the motion of an artificial satellite on a circular orbit explained?

A body launched at a given altitude and speed horizontal to the surface of the Earth follows an elliptical orbit with one focus coincident with the center of the Earth and the other near its point of launching. Increasing the velocity of subsequent launchings from the same point while retaining one focus coincident with the center of the Earth results in increased dimensions in the elliptical orbits, whereby a case occurs wherein both foci fall on the center of the Earth and the ellipse becomes a circle. In such a case, the body moves at a constant velocity equal to its initial velocity (circular velocity).

2. It is known that if a body attains a velocity greater than circular velocity it begins to move on an elliptical orbit. How does this ellipse differ from the preceding ones?

In contrast to the ellipses described, these ellipses have a second focus on the opposite side of the center of the Earth in relation to the launching point. With an increase in launching velocity, the second focus moves farther away from the center of the Earth and with an increase from 7.9 to 10 kilometers per second, the minor axis of the ellipse increases to three times the equatorial radius of the Earth. A further increase of one kilometer per second increases the minor axis to 25 Earth radii and at 11.1 kilometers per second the body will fly around the moon but still remain a satellite of the Earth. At a velocity of 11.2 kilometers per second (parabolic velocity), the focus moves away into infinity and the ellipse breaks into a parabola. This is the limit velocity for an artificial Earth satellite, as such a body will not orbit the Earth.

3. What is the smallest velocity in the orbit of an artificial satellite?

The velocity of a satellite is greatest at its perigee and smallest at its apogee. The velocity decreases with increasing distance of the apogee from the center of the Earth and can be made as small as desired. As an example, if the velocity of a satellite is 5 kilometers per second at its perigee and the apogee is at a distance five times greater than the distance of the perigee from the center of the Earth, then the velocity at the apogee will be one kilometer per second.

4. Is the mean velocity of satellites having the same period of revolution equal?

No. If the periods of revolution of different satellites were equal, then according to Kepler's third law, the major axes of the orbits of these satellites would also be equal. Since the minor axes of orbits have different dimensions, then the mean orbital velocity of these satellites would become smaller as the ellipse is flattened.

5. What is the relation between the velocities of a satellite moving on an ellipse and on a circle?

In the movement of a satellite on an elliptical orbit, its velocity is found to be that much greater than the velocity it would have had if it were moving in a circle with a diameter equal to the major axis of the ellipse, rather than smaller. If the ellipse were divided into two parts by its minor axis, then the velocity of the satellite corresponds more to the circular velocity when it moves in the portion of the ellipse closer to the Earth and is smaller when it moves on the other portion. The velocities of a satellite at the moments when it passes through the ends of the minor axis (points of intersection of the ellipse with its circle) are equal to a circular velocity.

6. When an observer on Earth sees that two satellites are moving in opposite directions, is this always actually the case?

The apparent movement of two satellites may appear as being in opposite directions, although in reality their directions of movement may in one case be the same and in the other the opposite.

As an example, take two satellites moving in the direction of the Earth's rotation on an equatorial plane with circular orbits 33,800 and 59,400 kilometers in radius. Assuming that at a certain moment both satellites appear as a point in the zenith to the observer, then the lower satellite with a period of 17.1 hours will describe an arc of  $360^\circ : 17.1 = 21^\circ$  in its orbit and the higher with a period of 40 hours will pass through an arc of  $360^\circ : 40 = 9^\circ$  in the same length of time. At the same time, due to the Earth's rotation, the observer moves through  $360^\circ : 24 = 15^\circ$  so that in relation to the observer the lower satellite passes him by  $21^\circ - 15^\circ = 6^\circ$  and the upper moves behind him  $15^\circ - 9^\circ = 6^\circ$ . Consequently, to the observer it will appear that the satellites are moving in opposite directions covering  $1^\circ$  each minute.

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7. It is known that the motions of planets sometimes seem to reverse themselves to an observer. Will it be possible to observe such a phenomenon in the movements of artificial satellites?

Yes, but this will be possible only in the case of satellites with an extremely distant apogee. Those satellites which move in a certain zone nearest the Earth will have an apparent direction of motion that coincides with their actual direction, since their angular velocity will be greater than the angular velocity in the rotation of the Earth. Those satellites moving in orbits in certain second and third zones beyond the first will have directions of motion that correspond for only a portion of their path. While near the Earth, the latter satellites will have a considerably great angular velocity and appear to be moving to the East, but as they near the boundary of the first two zones, their observable motion gradually decreases. On reaching the boundary they seem to stop momentarily (the angular velocity becomes zero) and then move in the opposite direction -- from East to West. This direction of motion continues until the satellites orbit back into the interzone boundary, whereby an apparent reversal of direction occurs.

8. Artificial Earth satellites could circle the entire surface of the Earth in one 24-hour period. Will it be possible to examine the surface of the moon on board its artificial satellite equally as quickly?

As the moon makes one complete rotation every 4 weeks, no less than 2 weeks would be required for examination of its entire surface as illuminated by the sun and reflections from the Earth. However, an accelerated survey method could be employed which would be independent of the moon's rotation. On completion of survey of a band of predetermined width around the moon and reaching a point above a pole of the moon, the astronauts could alter their orbital plane with rocket power by a predetermined angle in relation to the stars. A greater altitude would make it possible to survey a wider band so that at an altitude equal to the radius of the moon, it would only be necessary to make three passes requiring only 5 1/2 hours.

9. As is known, due to air resistance of the atmosphere, the orbit of an artificial satellite gradually decreases in size. Does the orbit decrease equally on all sides?

No. A sharp decrease occurs in the apogee, whereas the perigee is affected only slightly. Thus, an elliptical orbit gradually becomes almost circular. More precisely, a satellite describes a spiral which ends as a "shooting star" in the dense layers of the atmosphere.

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10. Will it be possible to fly back to the Earth from an artificial satellite?

Yes. With the help of a small rocket, a cosmic glider will shoot off from the satellite in a direction opposite the movement of the satellite. The glider's velocity will therefore be smaller than the orbital velocity of the satellite and it will follow an elliptical orbit approaching the Earth. On entering the dense atmosphere at its perigee, the glider will lose its speed and make an ordinary glider landing at about 100 kilometers per hour.

11. On descent from an artificial satellite flying at a high altitude, its atmosphere penetration velocity could be on the order of 11 kilometers per second. Isn't there a danger of the glider burning up?

Return to the Earth from a satellite at very high altitude will be accomplished in a manner different from the one previously discussed. In this case, the glider will make several passes around the Earth, losing speed each time it passes through the atmosphere at its perigee. Accumulated heat will be radiated at its apogee and the glider will subsequently land in the manner described in Question 10.

Ariy Abramovich Shternfel'd, chairman of the Scientific-Technical Committee of Cosmic Navigation, Astronautics, Section Central Aeroclub USSR, was born in 1905. His work, Vvedeniye v Kosmonavtiku (Introduction to Cosmonautics), was awarded the International Incentive Award by the Committee of Astronautics of the French Astronomical Society. His new book, Iskusstvennyye Sputniki Zemli (Artificial Earth Satellites), was published in Moscow in 1956. The second edition of the latter has been sent to press. (Tekhnika - Molodezhi, No 2, Feb 58, pp 5-7)

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#### Interplanetary Flight Questions Reviewed

Questions from readers of the popular Soviet magazine, Tekhnika - Molodezhi, were referred to the authors of a Soviet book on satellites. These authors, V. P. Kaznevskiy, P. K. Isakov, T. L. Rapoport and V. K. Lutskiy, had recently written the book, Sto Voprosov i Otvetov ob Iskusstvennykh Sputnikakh Zemli (One Hundred Questions and Answers on Artificial Earth Satellites) for the Znaniye publishers. The questions were treated as follows:

What are the perspectives for the development of astronautics in coming years?

Accomplishing the first step into the cosmos was the most difficult. It was necessary for this purpose to attain a velocity of 8 kilometers per second at a time when modern supersonic planes are developing no more than one kilometers per second. To completely overcome

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Earth's gravity requires an addition of little over 3 kilometers per second to the circular velocity. This is of course much simpler than increasing the velocity from one to 8 kilometers per second. For this reason, a vigorous development of astronautics can be expected to follow. Launching of an automatic rocket to the moon can be expected in the next few years. Manned trips on a circular orbit and to the moon are also problems for the next decades. This requires only the solution of the problem of return from an artificial satellite. Flights to neighboring planets will be realized as soon as an atomic rocket has been constructed. Scientists in a number of countries are already intensely working on the creation of such a rocket. As for flights to the stars, this is still a matter of the distant future. However, a number of theoretical questions on such a flight has already been solved.

What will the ship for interplanetary flights be like?

The outer appearance of an interplanetary ship will not be conventional. The cosmic ship will not require the streamlined forms characteristic of modern airplanes and rockets for its flight in interplanetary space.

It will consist of a number of spherical and cylindrical bodies with comfortable and spacious quarters for the astronauts. The cabins in an interplanetary ship will be more spacious than those of an airplane. As is known, for example, in a flight to Mars, it would be necessary for the astronauts to spend about a year in the ship.

The interplanetary ship will have an atomic jet engine and will be equipped with electric power plants using solar energy, dependable means of radio communication and perfected radar apparatus, and automatic controls which would make it possible to maintain a prescribed trajectory and speed of flight.

After cosmic transfer stations in the form of an artificial Earth satellite have been constructed and the parts of an interplanetary ship have been transported to them, the astronauts will assemble the ship. The assembled interplanetary ship will depart to planets from the orbit of the artificial satellite. On approaching a planet, the ship will brake its flight and convert itself into an artificial satellite of the planet. A small landing 'rocket-boat' will separate from the ship to transfer the astronauts to the planet.

Return to the Earth will be accomplished through the reverse procedure. Taking off for the return trip, the landing 'rocket-boat' flies up to the cosmic ship satellite awaiting it. The ship satellite receives the astronauts, starts its engine, and sets off for the artificial Earth satellite.

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Could rockets with liquid engines reach the moon?

"Yes, they could, and this would require an addition of still one more, or at the most, two stages to the rocket which placed the first artificial Earth satellites in orbit. Since the ratio of the useful weight to the initial weight of the rocket sharply decreases as a result of such an addition, it will be necessary to increase the first stages of the rocket.

Future artificial Earth satellites will definitely be used as launching platforms for cosmic ships. They will possess a number of advantages for this purpose.

In the first place, the force of gravity on the satellite is already partially overcome and it only remains to add about 3 kilometers per second to the satellite's velocity to overcome it completely. In the second place, it is possible that atomic, ion, or photon engines will be used in future cosmic rockets. Launching of such rockets from the Earth's surface could have an undesirable aftereffect due to their radioactive operation. However, launching from an artificial satellite will make it possible to avert the effects of the radioactive jet on the Earth's surface and atmosphere.

Accelerations developed by cosmic ships starting from a satellite can be very small and the ship can acquire velocity gradually. This will particularly facilitate the task of future designers of new types of rockets. In the beginning period of flights with liquid fuel rockets, the artificial satellites can be used as refueling stations. The value of artificial satellites as future interplanetary stations is undoubtedly tremendous.

Where does the condition of weightlessness begin?

Weightlessness, that is the absence of weight, appears after the rocket vehicle engines cease operation and the artificial Earth satellite enters on its prescribed orbit. The condition of weightlessness continues throughout the course of the satellite's flight in the cosmos. Investigations were conducted on the behavior and conditions of monkeys, mice, and dogs during high altitude flights in rockets. It was established that during weightlessness, certain movement coordinations became complicated for the animals. They attain very unnatural poses and lose the ability to grasp food. However, the rocket flight lasts only a few minutes. The experiment with the dog Layka carried in the second satellite showed that with appropriate training and with proper equipment of the special hermetic cabin, all vital functions take a completely normal course.

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What would have happened if a velocity greater than 8 kilometers per second had been imparted to the first artificial satellites?

It can be said that the capability of the rocket determines the speed of flight.

Thus, for example, if the first Soviet satellites had been given a velocity greater than 8 kilometers per second, they could have circled the Earth on more elongated trajectories, among which would have been a trajectory including the moon.

With a flight velocity somewhat greater than 11.2 kilometers per second, a rocket will move away continually into interplanetary space on a parabolic trajectory.

With a flight velocity greater than 16 kilometers per second, a rocket will leave our solar system forever and irrevocably leave for the cosmos. Such a velocity is called a hyperbolic velocity, at which the rocket moves on a hyperbolic trajectory.

It is interesting to note that the 8 kilometers per second velocity achieved by the first Soviet satellites by far exceeds the value of the circular and parabolic velocity at the surface of the moon and Mars. At the surface of the moon the circular velocity is 1.669 kilometers per second and the parabolic is 2.38 kilometers per second. At the surface of Mars the circular velocity is 3.562 kilometers per second and the parabolic is 5.15 kilometers per second.

"The latter velocity of 5.15 kilometers per second indicates that even now a Soviet rocket vehicle could surely start from Mars and reach the Earth or Venus." (Tekhnika - Molodezhi, Feb 58, pp 7-8)

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#### Use of Sputniks for Verification of Einstein's Theory Seen

In Moscow, it is believed that a third Sputnik will be launched soon containing more perfected technical equipment than its predecessors. Recently, Soviet Prof V. L. Ginsburg stated that among other equipment, it might also carry a powerful mercury lamp or "atomic clock" which would enable the verification of the theory dealing with "reduction of frequencies caused by gravitation," and such theories of Einstein. (Rome, L'Unita, 15 Mar 58)

[Note: In a recent lecture given at the main lecture hall of the All Union Society for the Dissemination of Political and Scientific Information, Vitaliy Lazarevich Ginsburg, Corresponding Member of the

Academy of Sciences USSR, spoke on the limitless horizons of scientific knowledge which were opened by the advent of the artificial satellite. New knowledge concerning the density of the air in the upper atmosphere, of radiowave propagation in the ionosphere, and of the biological effects on living creatures during flight in cosmic space will be obtained by these means, he said. Scientists will obtain data, he continued, which will aid them in the solution of a whole series of complex scientific problems. Of especially great interest he added, is the idea of using artificial satellites for the confirmation of the general theory of relativity. (Nauka i Zhizn', No 2, Feb 58)]

End of Sputnik II

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The following is the official Tass communique on the end of Sputnik II.

The second Soviet artificial Earth satellite, placed in orbit on 3 November, entered the dense layer of the atmosphere on 14 April, was disintegrated, and its existence terminated. According to available data, its parts were scattered along a path extending southeastward over small Atlantic islands, Brazil, and the Atlantic Ocean.

The sputnik, in the course of its existence of more than 5 months, changed the parameters of its flight orbit (the altitude of its apogee, period of revolution, etc.) during the gradual braking in the upper layers of the atmosphere.

Observation during the progress of the changes, and the scientific processing of the numerous materials from the measurements of the parameters of the Sputnik's motion gave valuable new information concerning the density of the upper layers of the atmosphere.

With the aid of the second sputnik, a large program of special scientific measurements directed toward the study of the Earth's ionosphere, measurement of cosmic rays, and radiowave propagation was accomplished. For the first time, several other geophysical problems were solved.

On board the sputnik, together with the scientific apparatus was a special container housing the dog Lajka. This made it possible to investigate the behavior of a living organism under the conditions of cosmic flight.

A large number of Soviet organizations cooperated in the observations and in the scientific processing of the results of the measurements. The data received from numerous observers are also valuable material.

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During the period of its existence, the second artificial Earth satellite completed about 2,370 revolutions of the Earth, traveling a distance of more than 100 million kilometers.

It repeatedly flew over all of the principal populated points of our planet. This was ensured by the orbit's large angle of inclination, 65 degrees to the plane of the Earth's equator.

The inclination of the orbit chosen for the Soviet sputnik ensured its observation during its motion in all of the inhabited parts of the world. The great size of the sputnik permitted it to be seen with the naked eye by all of the Earth's population. (Moscow, Pravda, 15 Apr 58)

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Photographic Observation of Sputnik II

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The All-Union Conference on Photographic Observation of the Artificial Earth Satellite was opened at the State Astronomical Institute imeni Shternberg in Moscow.

Twenty-five stations in the Soviet Union, located in different parts of the country, engaged in photographic observations of the sputnik. Scientific workers of the University stations for photographic observations from Uzhgorod, Tomsk, Baku, L'vov, Irkutsk, Tartu, and other cities and also astronomers from Pulkovo, Byurakan, Abastumani, Tashkent, and other observatories of the academies of sciences of the union republics arrived in Moscow to participate in the conference.

Scientific workers from these places exchanged the experience of photographic observations of the second artificial Earth satellite. This sputnik, due to its brightness, could be photographed with the usual cameras in addition to the special instruments. (Moscow, Pravda, 12 Apr 58)

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II. COSMIC RAYS

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Monochromatic Solar Filters Made in Czechoslovakia

Dr Ivan Solc, scientific worker, in the Research Institute for Minerals (Vyskumny ustav mineralov) in Turnov, concerned himself with the difficulties in obtaining monochromatic double refracting filters from natural quartz crystals for solar observation, and on the basis of his calculations and tests, he devised a series of prototypes of the monochromatic solar filter, which is composed of from 12 to 22 quartz plates with a diameter of 30 to 33 millimeters. The plates are polished on both sides and glued together with Canadian Balsam into a single element.

The new filter has substantial improvements and advantages over foreign filters. Its costs is a tenth to a twentieth of the foreign filters, and the chief superiority is the high -- up to 50 percent -- actinic property or property of clearness (svetelnost), while that of the Lyot type filter is of somewhat smaller percentage.

These filters have been delivered to the work centers of the Czechoslovak Academy of Sciences, and to people's observatories in Presov, Ostrava, Olomouc, Bratislava, and Prague. Requests from foreign observatories are coming in also. (Bratislava, Lud, 11 Mar 58)

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Cosmic Ray Studies in Armenian SSR

Some 17 kilometers from Yerevan, on the southern summit of Aragats, lies the constantly operating station for the study of cosmic rays of the Institute of Physics of the Academy of Sciences Armenian SSR. Here, at an altitude of 3,250 meters, groups of Armenian physicists, together with their colleagues from the Academy of Sciences USSR, conduct important scientific research work under the direction of A. I. Alikhanyan, Corresponding Member of the Academy of Sciences USSR and Academician of the Academy of Sciences Armenian SSR.

Here, for 15 years, physicists have been engaged in studying the composition of cosmic rays and the nature and properties of protons, mesons, and other "elementary particles" which make up cosmic rays.

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As far back as 1946, A. I. Alikhanyan and A. I. Alikhanov proposed a new method of studying the properties of the particles of cosmic radiation, which was later called the Alikhanyan-Alikhanov magnetic spectrometer method. It permits the simultaneous determination of the impulse, run, ionization, and mass of separate particles. The first use of this method has already led to the discovery of a great number of protons in the composition of cosmic rays, which, at the time, caused surprise among scientists.

In 1947, using the magnetic spectrometer, the first indications were obtained concerning the existence of new, unstable particles. Observations conducted on Aragats during 1949 — 1950, using an improved model of the magnetic spectrometer, were of great value in establishing the existence of heavy mesons which are unstable particles 960 times heavier than electrons. (Moscow, Pravda, 13 Apr 58)

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### III. OCEANOGRAPHY

#### Study on Deposition in the Northwestern Pacific

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New data on the extent and conditions of deposition of friable soil deposits in the northwestern part of the Pacific Ocean were accumulated by expeditions from the Institute of Oceanography of the Academy of Sciences USSR in two voyages aboard the Institute's ship, Vityaz'. In 1954, the investigations were conducted in the northwestern part of the Pacific to the southeast from the Kurile-Kamchatka arc and to the east from the island of Honshu. In 1955, studies were made in the Philippine depressions. Seismoacoustical methods were used.

It was found that the depositions on the bottom of the northwestern troughs of the ocean occur irregularly, are directed principally to the center part of the depression, and will lead to the filling up of a vast depression in the surface of the ocean bed. In the Philippine depression, the depositions also accumulate irregularly and fill a trough in the ocean bed.

The new data changes certain previous notions concerning the nature of depositions on ocean bottoms and necessitates considering the problem of the connection of deposition with geologic structure in a new way.

(Doklady Akademii Nauk SSSR, Vol 115, No 6, 1957, pp 1,107-1,110)

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IV. ARCTIC AND ANTARCTIC

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Aerial Expedition to North Pole

The annual cycle of scientific observations at the drift stations Severnyy Polyus-6 and Severnyy Polyus-7 has been completed. The first group of airplanes of the aerial expedition to the Arctic took off from a Moscow airfield on 27 March. The planes carried a group of polar scientists who were to replace the staffs at the drift stations. The planes also transported a number of automatic meteorological stations to be installed in various points of the Soviet Arctic. These stations will record the temperature, humidity, and pressure of the air at certain intervals and will transmit such data to the mainland.

The first plane to leave was piloted by polar aviator A. Kuz'min. The second plane, leaving the same morning, was piloted by S. A. Petrov. This plane was to land in Cherepovets to pick up a powerful KD-35 tractor. A third plane of this expedition was to leave later in the day. A second group of planes belonging to this expedition was expected to leave on 28 March.

According to a report from the Main Administration of the Northern Sea Route, the ice floe of Severnyy Polyus-6 is now drifting about 1,500 kilometers from the mainland. The ice floe of Severnyy Polyus-7 is about 400 kilometers from the North Pole. (Moscow, Vechernyaya Moskva, 27 Mar 58)

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Polish Expedition on Spitsbergen

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The work of the second group, consisting of ten persons, is planned for a duration of 15 months. A scientific base was organized on the shore of the bay, consisting of living quarters, a meteorological platform, a radio station, and garage. (Moscow, Vokrug Sveta, No 3, Mar 58)

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Soviet Station Oasis in Antarctic

About 300 kilometers east of the Soviet station Mirnyy in the Antarctic is a large ice-free area called Banger Oasis. Various theories have been advanced regarding the cause of this phenomenon which has aroused the interest of scientists. Some foreign scientists believed that this "oasis" was formed as a result of a 1,000-year process of combustion of underground coal deposits. Others believed that the powerful radioactive processes passing through this area had caused intensive melting of snow. Some specialists attributed the origin of the snow-free areas to volcanic activity.

The Soviet research station Oasis was established in this location on 15 October 1956. As a result of observations under the IGY program, Soviet scientists concluded that all the theories previously advanced by foreign specialists concerning the origin of the oasis were not based on facts. It was proved that the disappearance of ice from these areas of land took place very long ago in connection with the general warming-up process in Antarctica. Because of the peculiar ground relief of this particular area, the glaciers detour around the oasis. The sun heats the projecting rocks and intensifies the melting process. Snow and ice gradually retreat from this area. In this way the mountain ridge with adjoining lakes and rivers has been freed of permanent ice. Soviet scientists have estimated that the glaciers in this area have retreated at the rate of about one meter per year.

The landing strip of Oasis is about 20 kilometers from the station. A helicopter from Mirnyy recently made ten trips to the station Oasis on one day, carrying a new group of staff members headed by B. Imerekov and over 6 tons of various scientific equipment, food supplies, and other cargo. The new staff has begun its activities at Oasis, replacing the former staff under G. Pashchenko.

The station is conducting a complete series of meteorological, actinometric, and aerological observations. The Soviet scientists are also conducting observations in the field of terrestrial magnetism, seismology, aurora, and earth currents. Interesting materials were obtained by Professors O. Vyalov, K. Markov, G. Avsyuk, P. Shumskiy, M. Gellerbakh, and other scientists. The geological-aeromagnetic detachment, headed by Prof M. Ravich, made a detailed survey of the oasis area extending over 400 square kilometers. As a result of these activities, detailed maps of the region were compiled, which show its characteristic features.

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The area surrounding the station is rocky, with hills rising to 200-300 meters. The valleys and depressions have numerous lakes containing both fresh water and salt water. The color of the water on clear days is bright blue, blue-green, or sometimes brownish-green. White sediments of salt can be seen almost everywhere on the bottom of dry basins and on the slopes of hills. Large numbers of boulders and other signs point to the fact that this whole area was once completely covered with glaciers.

On the north side, fiord-type inlets cut into the coastline. However, the open sea is separated from the station area by a high ridge of ice.

During the antarctic winter, heavy storms blow over the oasis, driving the fresh snow off the surface. Even in the middle of the winter, the oasis remains almost free of snow.

There is very little animal and plant life in this region. Occasionally one encounters some seals, white stormy petrels, and jaegers (*Stercorarius*). (Moscow, Sovetskiy Flot, 17 Jan 58)

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#### Ob' Explores Antarctic Waters

The expedition ship Ob' has been weathering some heavy storms in the Antarctic. The ship encountered a hurricane in the second oceanographic profile between New Zealand and the coast of Antarctica. The antarctic autumn has begun.

Regular scientific observations aboard the Ob' are continuing. Hydrological observations form the principal part of research conducted by complex marine expeditions. These observations provide information on the water temperature at various depths, and on speed and direction of sea currents. On the basis of tests of samples of sea water obtained by bathometers, the hydrochemists determine the density and salinity of water, oxygen content, and other elements.

Biologists of the expedition under the supervision of A. Andriyashev, professor of the Zoological Institute, Academy of Sciences USSR, recently made some successful experiments, using a newly designed trawl for working at various ocean depths. This kind of trawling was done for the first time in the southern hemisphere. As a result, over 100 samples of fish and other marine animals were obtained from the depths of the sea.

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According to the IGY program, scientific stations all over the world conduct simultaneous meteorological observations. Aerometeorologists of the expedition on the Ob' also work under this program, continuing their regular observations and the launching of radiosondes.

The Ob' is conducting research in those areas which show up as blank spaces on maps. However, with the help of modern navigational instruments, the ship is able to navigate successfully in these waters.

The Ob' has been sailing for the past 6 months, during which period the ship was engaged in explorations in the East Antarctic, and it also visited several ports in Italy, South Africa, and Australia. After completing its work in the second profile, the Ob' will sail into the Western Hemisphere to continue its exploratory work in the Ross Sea.

(Lenin-gradskaya Pravda, 27 Mar 58)

#### New Meteorological Station in Antarctic

On 21 March, a tractor train consisting of three high-speed tractors of the "Pingvin" type left Mirnyy for Pionerskaya. The train will deliver food supplies, coal, and building materials to the wintering staff at Pionerskaya. A glaciological detachment traveling with this train plans to conduct seismic research in the area of Pionerskaya. Despite the approach of winter, strong winds, and snowstorms, the glaciologists will conduct tests at various depths to determine the temperature and hardness of the snow and firn.

At a distance of 250 kilometers from Mirnyy, members of the expedition will establish an automatic meteorological station on one of the icy mountain passes. This station will transmit complete meteorological data on this area twice daily to the observatory at Mirnyy. The data from the mobile automatic station operating on the ice cap, about 2,000 meters above sea level, will be used not only for compiling synoptic forecasts, but also for studying problems connected with the atmospheric circulation in the interior of Antarctica.

Glaciologists, seismologists, tractor drivers, radiomen, engineers, drilling experts, and other expedition members will live in the heated cabins of the tractors, and also in a small hut installed on one of the metal sledges. Engineer G. Burkhanov is in charge of the tractor train; Candidate of Sciences Kh. Zakiyev is the head of the glaciological detachment. The seismic research work will be performed by O. Sorokhtin and V. Koptev, members of the Institute of Physics of the Earth. G. Bolvin, an experienced polar scientist, will install and put in operation the first Soviet automatic meteorological station. The train will be conducted by navigator Yu. Avsyuk, who recently accompanied the tractor train into the central regions of Antarctica to the stations Vostok and Sovetskaya.

(Moscow, Vodnyy Transport, 27 Mar 58)

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Special Houses for Antarctic

The Zharkovskiy House-Building Combine, Kalininskaya Oblast, has produced prefabricated houses for the Antarctic expedition. The wall panels are made of waterproof plywood. The center of the panels contains not one, as usual, but seven layers of wood-fiber material, which is a reliable heat insulator. The windows are reinforced with rubber strips and have four layers of special glass, stalinite. During 1957, the workers of Zharkovskiy shipped prefabricated parts of houses for a number of scientific research stations to Mirnyy. The combine also produced mobile huts for magnetological research which have no iron or steel parts. (Moscow, Sovetskaya Rossiya, 1 Feb 58)

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Geographical Observations in Antarctica

L. D. Dolgushin, a member of the geological-geographical detachment of the Soviet Antarctic Expedition during 1956-1957, has published a 20-page report on Soviet geographical observations in Antarctica in a recent issue of the bimonthly publication of the Academy of Sciences USSR. (Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 1, Jan-Feb 1958, pp 28-47)

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